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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/998,512	11/30/2001	Minquan Cheng	2001B111	6517

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EXAMINER

NGUYEN, TAM M

ART UNIT	PAPER NUMBER
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1764

DATE MAILED: 12/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/998,512

Applicant(s)

CHENG ET AL.

Examiner

Tam M. Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 August 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 16 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- 1) ☐ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1 and 5-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hsia et al. (4,506,106) in view of Kuechler et al. (6,441,261) or Kuechler et al. (6,121,504).

Hsia discloses a process for converting an oxygenated hydrocarbon including methanol (MeOH), dimethylether (DME), or the like to produce olefins by contacting the oxygenated hydrocarbon with a catalyst to form an olefin composition comprising water and oxygenated hydrocarbon (e.g., methanol and DME). The olefin composition is then cooled and separated into an olefin containing vapor stream and water containing stream. The vapor stream is then compressed and separated into an olefin product, which is then separated into an ethylene rich stream and a C₃₊ olefins (including propylene) stream, and an oxygenated hydrocarbon stream. The oxygenated hydrocarbon stream is then combined with the water containing stream to produce a combined stream which is then passed into a separation zone to recover an oxygenated hydrocarbon product. From Figure 2, it appears that the compressed vapor stream is contacted with water from the oxygenates stripper. Hsia discloses that the conversion catalyst is ZSM-5 (a molecular sieve catalyst). It is noted that Hsia does not specifically disclose that the water containing stream comprises at least 1 wt. % of oxygenated hydrocarbon. However, Hsia discloses that 25-90% of feedstock is converted per reactor pass and the water containing stream contains majority of the unconverted oxygenated hydrocarbon. Therefore, it would be expected that the water containing stream comprises at least 1 wt. % of oxygenated hydrocarbon as claimed. (See col. 2, lines 8-24, lines 53-59; col. 3, line 48 through col. 4, line 63; Table I; col. 5, lines 39-68; col. 6, lines 10-43; figure 2)

Claim 1: Hsia does not specifically disclose that the catalyst for converting an oxygenate to an olefins is a small pore molecular sieve catalyst.

Kuechler'504 discloses a process for converting oxygenates to olefins wherein a small pore molecular sieve catalyst is used. (See col. 2, lines 55-59)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Hsia by utilizing a small pore molecular sieve catalyst as taught by Kuechler'504 because Kuuechler'504 teaches that either a small pore or medium pore molecular sieve catalyst can be used in the process for converting oxygenates to olefins.

Claim 1:

Hsia does not disclose that the effluent product from the reaction zones is cooled by quenching with a medium.

Both references of Kuechler disclose a process for converting oxygenates to olefins wherein the olefinic product stream is quenched with medium such as water to cool the product stream. (See Kuechler'504; abstract, col. 6, line 63 through col. 7, line 6; see Kuechler'261; col. 10, line 58 through col. 11, line 16)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Hsia by utilizing a quench step as disclosed by Kuechler because such step would increase heat recovery and improve heat integration of the process. Consequently, the modified process of Hsia is similar to the claimed process in terms of feedstock and catalyst. It is naturally expected that the olefin composition would comprise at least 20 wt.% ethylene and propylene on a water containing base as claimed.

Claim 5:

The water containing stream and the oxygenated hydrocarbon containing stream are first combined and then separated in a separator (oxygenated stripper). (See Hsia's figure 2)

Claim 6:

Hsia does not disclose that the water containing stream and the oxygenated hydrocarbon containing stream are both combined and separated within a separator. However, water is separated from oxygenated hydrocarbons in the stripper (see Hsia's figure 2). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Hsia by combining and separating the streams within a separator because it would be expected that the results would be the same or similar when either (1) combining the streams within a separator or (2) combining the streams and feeding the combine steam in a separator because in both cases water is separated from the oxygenated hydrocarbons.

Claim 7:

The vapor stream is compressed at 310 psig (see col. 6, lines 10-11).

Claims 8-11:

Hsia does not disclose that the oxygenated hydrocarbon product contains not greater than 50, 40, 30, or 25 wt. % of water. However, Hsia desires to employ a feedstock which may comprise about 4 to 17 % water. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Hsia by producing an oxygenated hydrocarbon product comprising the claimed amount of water because the oxygenated hydrocarbon product would be combined with the methanol feedstock and Hsia desires a combined feedstock comprising a small amount of water (see col. 3, lines 66-67; col. 4, lines 19-24). Therefore, it would be effective to produce an oxygenated hydrocarbon product containing the claimed amount of water.

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over references as applied to claim 2 above, and further in view of Kuechler et al. (6,137,022).

Claims 3 and 4:

Hsia does not disclose a step of polymerizing the ethylene and propylene containing streams.

Kuechler teaches that olefin products, which are obtained from a MTO process, can be polymerized (see col. 4, lines 61-65).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the process of Hsia by polymerizing the ethylene and propylene containing streams as taught by Kuechler because the polymerizing step is known in the art and one of skill in the art would polymerize the ethylene and propylene containing streams since polyethylene and polypropylene product can be used in hundreds of applications (e.g., plastics)

Response to Arguments

The argument that Hsia does not disclose the use of a small pore molecular sieve is not persuasive because Kuechler'504 discloses that it is effective to use either small or medium pore molecular sieve in a process for converting oxygenates to olefins. Given the teaching of Kuechler'504, one of skill in the art would use either a small or a medium pore molecular sieve catalyst the in the process of Hsia.

The argument that Hsia does not disclose contacting the olefin composition with a quench fluid to cool the composition is not persuasive. Both references of Kuechler'261 and

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Kuechler'504 teach a process for converting oxygenates to olefins wherein the olefinic product stream is quenched with medium such as water to cool the product stream. Therefore, one having ordinary skill in the art would have modified the process of Hsia by utilizing the quench step as disclosed by Kuechler because such step is effective to cool the olefinic product, increase heat recovery, and improve heat integration.

The argument that removing propylene from the Hsia process would be counter productive, since the amount of desired distillate product would ultimately be reduced is not persuasive. The claimed process does not claim that propylene is separated from the propylene containing stream. In addition, Hsia teaches that the stream containing propylene is recovered before passing into the oligomerization zone (polymerization) as claimed.

The argument that combining the teaching of any Kuechler reference would destroy the desirable product produced by Hsia because the Kechler references are generally concerned with maximizing the amount of light olefin produced from methanol, whereas Hsia is concerned with maximizing the amount of distillate produced from methanol is not persuasive because applying the quenching step of Kuechler in the process of Hsia would not chemically change the olefin composition Hsia, but only improve cooling and heat integration of the process.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tam M. Nguyen whose telephone number is (571) 272-1452. The examiner can normally be reached on Monday through Thursday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tam M. Nguyen
Examiner
Art Unit 1764

TN



Walter D. Griffin
Primary Examiner